

# THE MINERAL INDUSTRIES OF BENIN, CAPE VERDE, CENTRAL AFRICAN REPUBLIC, AND TOGO

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## BENIN

The West African country of Benin was a producer of cement, clay, gold, and sand and gravel. Other reported mineral occurrences included iron ore, limestone, marble, phosphate rock, rutile, silica sand, and stone (Ministère des Mines, de l'Energie, et de l'Hydraulique, 1992, p. 3, 9-10, 15, 18-19, 21). The Ministère des Mines, de l'Energie, et de l'Hydraulique was responsible for the administration of the mining sector. The Office Béninois de Recherches Géologiques et Minières was responsible for mineral development administration.

In 2003, the gross domestic product (GDP) was estimated on the basis of purchasing power parity to be about \$7.5 billion. The GDP grew by 4.8% in 2003 compared with 6% in 2002. Manufacturing and handicrafts accounted for 9% of the GDP; construction and public works, 4%; water, gas, and electricity, 1%; and mining and petroleum, less than 1%. From 1998 to 2003, the value of output in the mining and petroleum sector fell by nearly 80% because of the cessation of petroleum production. During the same period, the value of output in the water, gas, and electricity sector nearly doubled (International Monetary Fund, 2004a, p. 53-54; 2004b, p. 206; 2004<sup>1</sup>).

Artisanal miners produced small amounts of gold. Ciments du Benin S.A., Société des Ciments du Benin, and Société des Ciments d'Onigbolo produced cement; these companies had a combined cement production capacity of 875,000 metric tons per year (t/yr) (table 2). Limestone was quarried at Pobe for use in Société des Ciments d'Onigbolo's cement plant. Société Benino-Libyenne des Mines produced marble at Dadjò.

Resources of iron ore at Loumbou-Loumbou and Madekali were estimated to be up to 500 million metric tons (Mt) at a grade of 46% to 52% iron. Development of these resources depended upon the availability of electricity. The state-owned utility Société d'Eau et d'Electricité was investigating the possibility of building a new dam and a 900-megawatt hydropower station at Arjarala. The cost of the project was estimated to be \$150 million; the phosphate deposits at Mekrou could become more viable if the dam were completed (Crankshaw, 2003).

In 2003, Benin's production of electricity increased to 67 gigawatthours (GWh) from 53.1 GWh in 2002 and 58 GWh in 1998. From 1998 to 2003, imports of electricity from Ghana rose to 512.8 GWh from 252.3 GWh. During the same period, domestic consumption of electricity rose to 474.2 GWh from 266 GWh (International Monetary Fund, 2004a, p. 62).

Benin did not produce or refine petroleum and depended upon imports to satisfy its petroleum requirements. In 2003, imports of petroleum products amounted to \$74.1 million, or 11% of total imports (International Monetary Fund, 2004a, p. 79).

In May 2003, the West African Gas Pipeline Company Ltd. (WAPCo) (a consortium composed of Chevron Nigeria Ltd., Nigerian National Petroleum Corp., Shell Petroleum Development Company of Nigeria Ltd., and the Volta River Authority of Ghana) signed an agreement with the Governments of Benin, Ghana, Nigeria, and Togo that confirmed the parties' commitment to building the West African Gas Pipeline. The 1,000-kilometer (km) pipeline could begin to deliver natural gas from Nigeria to existing and planned powerplants in Benin, Ghana, and Togo by mid-2005 (Chevron Nigeria Ltd., 2003).

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## CAPE VERDE

Mining's contribution to the economy of Cape Verde, which is an archipelago of 10 islands and 8 islets located about 600 km off the West Coast of Africa, was minimal. In 2003, the nation's GDP, which was calculated on the basis of purchasing power parity, was

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<sup>1</sup>References that include a section mark (§) are found in the Internet Reference Cited sections.

estimated to be \$2.4 billion. The GDP increased by 5.3% in 2003 compared with 4.9% in 2002 (International Monetary Fund, 2004, p. 206; 2004\$).

Most of the nation's mineral requirements were imported; cement imports were estimated to be 170,000 metric tons (t). In early 2004, Cape Verdean and Italian investors planned to start construction of a cement plant with a capacity of 40,000 t/yr. The plant, which was expected to cost \$5 million, would use pozzolanic materials from Santo Antao Island. Resources of pozzolanic materials on Santo Antao Island were estimated to be 6 Mt (International Cement Review, 2003; Panafrican News Agency, 2003).

Salt was produced on the islands of Mindelo and Sal; gypsum on Maio; limestone, on Boa Vista, Sal, and Santo Antao; and volcanic rock, on Santo Antao. Production of clay on Boa Vista, Sal, and Sao Vicente was intermittent. The Direcção Geral da Energia regulated the importation and distribution of mineral fuels. No domestic oil or natural gas production was reported.

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## CENTRAL AFRICAN REPUBLIC

The mining industry of the Central African Republic was dominated by the production of diamond and gold; small amounts of kaolin and quartz crystals were also mined. Other mineral occurrences in the Central African Republic that have been identified include copper, graphite, ilmenite, iron ore, kyanite, lignite, limestone, manganese, monazite, rutile, salt, tin, and uranium.

In 2003, the GDP based on purchasing power parity was estimated to be about \$4.6 billion. The GDP fell by 7.5% in 2003 compared with a decline of 0.6% in 2002. The mining sector accounted for nearly 7% of GDP; construction, 4%; manufacturing, 2%; and public utilities, 1%. In 2003, the value of output in the mining sector contracted by 7% because of lower diamond and gold production. In the manufacturing sector, the value of output fell by about 22%, and in the public utilities sector, by 1%. The downturn in the economy was partially attributable to a civil war that started in October 2002 and concluded with the overthrow of the Government in March 2003. The temporary suspension of mining licenses following the war also contributed to the recession (International Monetary Fund, 2004a, p. 55, 57; 2004b, p. 206; 2004\$; World Bank Group, 2004, p. 4).

Diamond was produced from alluvial deposits situated along northern rivers that flow from the Democratic Republic of the Congo. In 2003, national diamond production fell to 332,700 carats from 416,400 carats in 2002 and 420,000 carats in 1998. Gem-quality diamond accounted for 70% to 80% of total production. Diamond exports amounted to 329,600 carats at a value of \$48.9 million in 2003, or 42% of total exports. Most of the diamond was exported in rough form. The decline in diamond exports in 2003 was partially attributable to the temporary suspension of mining licenses (International Monetary Fund, 2004a, p. 34, 46, 63, 77; World Bank Group, 2004, p. 4).

Artisanal miners accounted for more than 90% of the Central African Republic's diamond production. About 160,000 to 180,000 workers were involved in artisanal mining operations. Several small-scale local mining companies and companies with temporary mining permits accounted for the remaining production. The development of commercial-scale diamond mines has been inhibited by the difficulty of establishing adequate security for alluvial deposits, which are often in remote parts of the country (International Monetary Fund, 2004a, p. 34-35, 37).

The Government was trying to increase artisanal diamond production by forming mining cooperatives. Individual artisanal miners were unable to invest in equipment that would increase their productivity because of unstable incomes; with cooperatives, however, miners could pool their risks and borrow the funds needed to purchase motor pumps and excavators. The number of mining cooperatives has risen from 5 to 150 in recent years (International Monetary Fund, 2004a, p. 43).

Diamondworks Ltd. of Canada held concessions for the Banguna, Bria, Gbali, Mambere, Nzako, and Ouandja alluvial diamond mining areas. The company had exclusive rights to buy diamond from the 60,000 artisanal miners who worked on its properties. Diamondworks planned to explore for kimberlites in 2004 (Mining Review Africa, 2004).

Vaaldiam Resources Ltd. of Canada planned to explore for diamond at its CAR Kimberlite Project by the end of 2004. The company's exploration activities were on hold in 2003 as the company focused on acquiring properties in Brazil. Vaaldiam also held a 1% gross royalty on diamond production from the Boungou River alluvial deposit. By the third quarter of 2004, Boungou River was expected to start producing diamond at a rate of 30,000 carats per year (Vaaldiam Resources Ltd., 2004).

The Ministère des Ressources Énergétiques et Minérales was responsible for the administration of the mining sector in the Central African Republic. Official diamond exports were handled by the Government's Bureau d'Évaluation et du Contrôle du Diamant et Or, which signed a 4-year contract with Independent Diamond Valuers of Belgium in 2002 to verify the Bureau's valuation of diamond exports. The change in Government in March 2003 prompted a review of the Central African Republic's compliance with the Kimberley Process certification program for eliminating trade in conflict diamond. (Conflict diamond is diamond that originates from areas controlled by forces opposed to internationally recognized Governments; the forces use proceeds from the sale of diamond

to fund military action against the Governments or in contravention of decisions of the United Nations Security Council.) In June, the Central African Republic was found to be in compliance with the Kimberley Process; the Government was encouraged to continue to strengthen its internal monitoring and controls. The Government established a diamond exchange in Bangui that allows artisanal miners to sell diamond directly to competing international diamond buyers and reduces the incentive for smuggling (International Monetary Fund, 2004a, p. 45, 50; World Bank Group, 2004, p. 4).

Artisanal miners produced gold from the Bandas and Bogoin-Boali greenstone belts. In 2003, reported gold production fell to 2 kilograms (kg) compared with 16 kg in 2002 and 24 kg in 1998. Actual gold production was estimated to be about 1,000 kilograms per year. Axmin Inc. of Canada explored for gold on the Bambari permit. Following the discovery of iron ore at Topa in the northern part of Bambari, Axmin's license was amended to include the right to explore for ferrous and base metals (Harben and Harris, 2003; International Monetary Fund, 2004a, p. 63).

The Central African Republic did not produce mineral fuels in 2003 and depended upon imports for its energy requirements. In 2003, imports of petroleum products amounted to \$8.4 million, or about 8% of national imports. Grynberg Petroleum Company of the United States held a concession in the Doseo and Salamat basins that covered about 55,000 square kilometers (Africa Energy Intelligence, 2003; International Monetary Fund, 2004a, p. 78).

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## TOGO

Togo, which was a small West African country, produced cement, clinker, diamond, gold, limestone, and phosphate rock. The country also had resources of bauxite, gypsum, iron ore, manganese, marble, rutile, and zinc. The Ministère de l'Équipement, des Mines, de l'Énergie et des Postes et Télécommunications was responsible for the administration of the mining sector.

In 2003, Togo's GDP was estimated to be \$7.2 billion on the basis of purchasing power parity. The GDP increased by 2.7% in 2003 and 4.2% in 2002 after decreasing by 0.2% in 2001. Manufacturing accounted for 10% of GDP; electricity, gas, and water, 4%; mining, 3%; and construction, 2% (International Monetary Fund, 2004b, p. 206; 2004§).

Ciments du Togo and West African Cement Company produced cement. West African Cement Company produced about 1.2 million metric tons per year of clinker, most of which was exported. The company operated a limestone quarry at Tabligbo; limestone from the quarry was exported to the Diamond Cement Factory in Ghana. Resources at Tabligbo were estimated to be more than 175 Mt. Ciments du Togo produced about 350,000 t/yr of cement; the company exported cement throughout West Africa. Cement consumption rose to an estimated 520,000 t in 2002 from 500,000 t in 2001 (International Cement Review, 2003; Palut, 2003).

Togo's production of phosphate rock rose to 1.47 Mt in 2003 from 1.27 Mt in 2002 (table 1) following the rehabilitation of production equipment by International Fertilizers Group Togo. The country's economic recovery in 2002 and 2003 was partially attributable to higher phosphate rock production. Exports of phosphate rock were nearly 1.36 Mt in 2003 compared with 1.33 Mt in 2002. Resources of phosphate rock were estimated to be more than 1.26 billion metric tons (Banque Centrale des États de l'Afrique de l'Ouest, 2003, p. 20; Palut, 2003; International Monetary Fund, 2004a).

Togo did not produce or refine petroleum and depended upon imports to satisfy its petroleum requirements. Togo Hunt Oil Co. (a subsidiary of Hunt Oil Co. of the United States) had a production-sharing agreement with the Government for Togo's entire offshore area.

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TABLE 1  
BENIN, CAPE VERDE, CENTRAL AFRICAN REPUBLIC, AND TOGO: PRODUCTION OF MINERAL COMMODITIES <sup>1</sup>

(Metric tons unless otherwise specified)

Commodity	1999	2000	2001	2002	2003 <sup>e</sup>
<b>BENIN</b>					
Cement, hydraulic	200,000	250,000	250,000	250,000	250,000
Clay	NA	--	17,716	19,000 <sup>r, e</sup>	21,000
Gold kilograms	15 <sup>r, e</sup>	-- <sup>r</sup>	16 <sup>r</sup>	20	20
Gravel cubic meters	NA	33,027	24,675	26,000 <sup>r, e</sup>	28,500
Petroleum, crude thousand 42-gallon barrels	--	-- <sup>r</sup>	-- <sup>r</sup>	--	-- <sup>2</sup>
<b>CAPE VERDE<sup>3</sup></b>					
Salt <sup>e</sup>	1,600	1,600	1,600	1,600	1,600
<b>CENTRAL AFRICAN REPUBLIC</b>					
Diamond carats	461,900 <sup>r</sup>	464,000 <sup>r</sup>	452,700 <sup>r</sup>	416,400 <sup>r</sup>	332,700 <sup>2</sup>
Gold kilograms	41	15 <sup>r</sup>	34 <sup>r</sup>	16 <sup>r</sup>	2 <sup>2</sup>
<b>TOGO<sup>4</sup></b>					
<b>Cement:<sup>e</sup></b>					
Clinker	1,000,000	1,000,000	1,000,000	1,000,000	1,200,000
Cement, hydraulic <sup>5</sup>	600,000	700,000	800,000	800,000	800,000
Limestone	2,400,000	2,400,000	2,400,000 <sup>e</sup>	2,400,000 <sup>e</sup>	2,400,000
<b>Phosphate rock, beneficiated product:</b>					
Gross weight thousand metric tons	1,715 <sup>r</sup>	1,370 <sup>r</sup>	1,067 <sup>r</sup>	1,271 <sup>r</sup>	1,471 <sup>2</sup>
P <sub>2</sub> O <sub>5</sub> content <sup>e</sup> do.	620 <sup>r</sup>	490 <sup>r</sup>	380	460	530

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. NA Not available. -- Zero.

<sup>1</sup>Includes data available through October 6, 2004.

<sup>2</sup>Reported figure.

<sup>3</sup>Cape Verde also presumably produced clay, gypsum, limestone, and pozzolana, but output is not reported, and available information is inadequate to make estimates of output levels.

<sup>4</sup>Togo also presumably produced diamond and gold, but output is not reported, and available information is inadequate to make reliable estimates of output levels.

<sup>5</sup>Includes cement produced from imported clinker.

TABLE 2  
BENIN, CAPE VERDE, AND TOGO: STRUCTURE OF THE MINERAL INDUSTRIES IN 2003

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>BENIN</b>			
Cement	Société des Ciments d'Onigbolo (Amida Group, 100%)	Onigbolo plant	450,000 cement; 500,000 clinker.
Do.	Ciments du Benin S.A. (Scancem International of Norway, 48.7%)	Cotonou plant	275,000 cement.
Do.	Société des Ciments du Benin (Government, 50%, and private, 50%)	do.	200,000 cement.
Petroleum, crude <sup>1</sup> thousand 42-gallon barrels	Zetah Oil Company of Côte d'Ivoire (private, 100%)	Sèmè Kpodji	365.
<b>CAPE VERDE</b>			
Salt	Groupe Salins de France (private, 100%)	Mindelo and Sal Islands	2,000.
<b>TOGO</b>			
Cement	Ciments du Togo (Scancem International, 99.6%)	Lomé plant	600,000 cement.
Do.	West African Cement Company (Indian Kenyan Co., 100%)	Tabligbo	400,000 cement; 1,200,000 clinker.
Limestone	Ciments de l'Afrique de l'Ouest (private, 100%)	do.	2,400,000.
Phosphate rock	Office Togolais des Phosphates (Government, 100%)	Akoumpe and Hahotue	2,000,000.

<sup>1</sup>Not operating in 2003.